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09/933,668	08/22/2001	Hanac Nakatani	46271	6697

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EXAMINER

DICUS, TAMRA

ART UNIT	PAPER NUMBER
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1774

DATE MAILED: 09/15/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/933,668

Applicant(s)

NAKATANI ET AL.

Examiner

Tamra L. Dicus

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 29 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1,7-10,12 and 13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,7-10,12 and 13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## **DETAILED ACTION**

### ***Response to Amendment***

Acknowledgement is made of Applicant's cancellation of claims 2-6, 11, and 14 in Paper No. 11 submitted 7-29-03. The 103 rejection over Kaneko US Pub 2001/0004487 is withdrawn due to Applicant's arguments.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1(amended), 6-10, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 5,677,067 to Kojima et al., in view of USPN 5612281 to Kobayashi et al. and USPN 5,541,002 to Hosoi et al.

Kojima discloses several examples of ink jet recording sheets (printing material) comprising a base paper covered on both sides by a polyolefin resin of low and high density polyethylene (same polymers as applicant uses) at col. 7, lines 40-44, with the polyolefin resin-coated paper support (base) having a thickness of 50-300 microns (see col. 7, line 35), where a thickness of the resin coated layer has a thickness of 5-50 microns (see col. 7, line 67), meeting the requirements of claim 1 values of 8 or more and less than 20 microns. The recording sheet further comprises an ink receptive layer on either one or both sides of the paper (see col. 4, lines 50-54), containing inorganic fine particles of antistatic agents or pigments like silica (see col. 4,

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line 41; col. 5, line 66; col. 13, line 67), a hydrophilic binder of polyvinyl alcohol, and an amphoteric surfactant in an amount of 0.1 to 5% by weight at col. 7, lines 15-19 meeting the limitations of claims 1 and 8 at col. 9, lines 20-32. Kojima further discloses the polyethylene resins used on the base paper may be a low-density polyethylene, a medium-density polyethylene, a high-density polyethylene or a mixture thereof and further explains the low-density polyethylene has a density of  $0.915\text{--}0.930\text{ g/cm}^3$  and the high-density polyethylene has a density of  $0.950\text{ g/cm}^3$  or higher and depending on how the polyethylene resins are used, alone or in combination, it is possible to have different densities at col. 5, lines 15-21. Since the polymer resins of claim 1 are the same and have a base paper covered in the same polyolefin resin on both sides of the paper (this is equivalent to the polyolefin resin layer at the opposite surface) with the same thickness as per instant claim 1, ranging between 50-300 microns at col. 4, lines 58-62 and at col. 5, lines 31-35 the thickness of the resin coated paper on only one side or both sides is between 5-50 microns, which is included in applicant's claimed range of 5-50 microns; therefore, the relation equation  $\{(B+C)/A\}$  will equal 0.15 to 0.45, and the ratio of polyolefin resin layer thicknesses on or opposite the ink receptive layer surface of claim 1 will be less than 1. With regards to the base paper density between  $0.60$  and  $1.05\text{ g/m}^3$ , Kojima teaches a support may be of woodfree paper, nonwoven fabrics, or natural pulp (same as applicants) at col. 9, lines 8-15 and col. 10, lines 38-53. Such a property as the density of the base paper is result effective and therefore optimizable. Basis weight and thickness directly effect density. Essentially, the thicker the paper, the higher the density, and if one so desires to manufacture a base paper between  $0.60$  and  $1.05\text{ g/m}^3$ , one would definitely be motivated by obvious reasons such as cost, a thinner paper will provide a cost savings. See further reference of Hosoi to ink jet papers

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teaching density of papers may very well range between  $0.60$  and  $1.05 \text{ g/cm}^3$ , at col. 3, lines 44-46 Hosoi teaches density  $0.70$  to  $0.90 \text{ g/cm}^3$ . Also, Kojima teaches the base paper may be calendered to improve surface smoothness at col. 10, lines 50-55. It would have been obvious to one of ordinary skill in the art to modify the paper of Kojima to include paper having a density between  $0.60$  and  $1.05 \text{ g/cm}^3$ , because Hosoi teaches density of the paper is conventional for ink jet papers as cited above.

Kojima fails to expressly disclose fumed silica in an amount of 50 to 90 % by weight, as per amended claim 1, and Kojima is further silent to fumed silica having a particle size of 5 nm to 50 nm, as in amended claim 1. Kobayashi, an analogous art, teaches processing inorganic fine inorganic silica in a dry process to produce "fumed silica". Kobayashi explains using a flame hydrolysis process in which silicon halide is hydrolyzed in a high-temperature gas phase to obtain silica containing no water, and an arc process in which siliceous sand and coke are heated, reduced and vaporized by means of arc in an electric furnace, followed by oxidizing with air, to obtain anhydrous silica at col. 6, lines 27-39. The silica fine particles are 3 to 10 nm and 10 to 100 nm, shown in col. 5, line 50 and col. 6, lines 56-57. This is in applicant's claimed range of 5 to 20 nm, as in claim 10. Further regarding claim 10, Kobayashi teaches a BET in the range of 100 to 250  $\text{m}^2/\text{g}$ , meeting Applicant's range of 100 to 400  $\text{m}^2/\text{g}$ . It would have been obvious to one of ordinary skill in the art to modify Kojima's ink jet recording sheet to include fumed silica size of 5 to 20 nm because Kobayashi teaches fumed silica easily forms a three-dimensional structure having particularly high void volume which is required for excellent ink absorptivity (col. 5, lines 1-15). Further, it would have been obvious to one of ordinary skill in the art to further optimize the amount of particles added to provide fumed silica in the amount of 50 to 90

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wt. % as in claim 5, and in claim 1 in an amount from 10 to 35 g/m<sup>2</sup> because Kojima teaches that in order to control the values of chroma L, a and b at the surface of the support on which the ink-receiving layer is to be coated, various colorants, such as silica, may be added to the base paper layer, the intermediate layer, or the resin coat layer and that the amount of such colorants may be optionally changed depending on the hue characteristics or coating weight in order to exhibit excellent light resistance and heat resistance of the ink-receiving layer at col. 10, lines 10-30.

Regarding claim 12, Kojima teaches a subcoat (equivalent to subbing) layer on a support with an ink-receiving layer over it at col. 8, lines 20-25, the subcoat layer may be of a water-soluble polymer or latexes (same as Applicant). While Kojima is silent to the coating weight of the subbing layer of 10 to 500 mg/m<sup>2</sup>, the coating weight is optimizable. It would have been obvious to one of ordinary skill in the art to modify the basis weight range, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272. Coating weight directly effect density.

3. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 5,677,067 to Kojima et al., in view of USPN 5612281 to Kobayashi et al. and USPN 5,541,002 to Hosoi et al., and further in view of USPN 6,165,606 to Kasahara et al.

4. Kojima essentially teaches the claimed invention, as applied above, but is silent to adding boric acid as instant claim 14. Kasahara teaches at col. 15, lines 5-20 the ink-jet recording layer sheet with a void-containing layer, has a hardening agent that is cross-linkable with the hydrophilic binder polyvinyl alcohol, to improve the film forming properties of avoid-containing layer, the water-resisting properties, and the film strength after printing. The hardening agents

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include organic hardening agents comprising boric acid, borax. Therefore, it would have been obvious to one of ordinary skill in the art to modify the ink jet of Kojima to further include boric acid for the purpose of improving the various aforementioned properties as taught by Kasahara as cited above.

### ***Response to Arguments***

Applicant's arguments filed 7-29-03 have been fully considered but they are not persuasive.

3. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Kojima and Kobayashi are analogous and applicable in the ink jet art. Kojima discloses several examples of ink jet recording sheets (printing material) comprising a base paper covered on both sides by a polyolefin resin of low and high density polyethylene (same polymers as applicant uses) at col. 7, lines 40-44, with the polyolefin resin-coated paper support (base) having a thickness of 50-300 microns (see col. 7, line 35), where a thickness of the resin coated layer has a thickness of 5-50 microns (see col. 7, line 67), meeting the requirements of claim 1 values of 8 or more and less than 20 microns. Applicant points to the glossiness property and surface flaws, stating the flaws can't be solved by employing conventional polyolefin-resin

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coated paper. The Examiner notes the glossiness property is inherent since the same materials are taught. The surface is the same surface since the same materials are used.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tamra L. Dicus whose telephone number is (703) 305-3809. The examiner can normally be reached on Monday-Friday, 7:00-4:30 p.m., alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia Kelly can be reached on (703) 308-0449. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 746-8329 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Tamra L. Dicus  
Examiner  
Art Unit 1774

September 5, 2003

CYNTHIA H. KELLY  
SUPERVISORY PATENT EXAMINER  
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